

WHAT IS CLAIMED IS:

1. An image reading apparatus which can operate in a plurality of image processing modes, comprising:

5 a photoelectric converter for reading an object image and outputting an electrical signal;

a reference member used to correct image read nonuniformity of said photoelectric converter;

an illumination light source for illuminating an object and said reference member with light; and

10 a controller for controlling a read start timing of said reference member by said photoelectric converter after said illumination light source is turned on in correspondence with a currently set image processing mode of the plurality of image processing modes.

2. The image reading apparatus according to claim 1, further comprising a timer for measuring a time period elapsed since said illumination light source is turned on,

20 wherein said controller sets a wait time in correspondence with the currently set image processing mode, and controls said photoelectric converter to begin to read said reference member after a lapse of the wait time since said illumination light source is turned on.

25 3. The image reading apparatus according to claim 2, wherein the image processing modes include a text mode

and a photo mode, and a wait time in the photo mode is longer than a wait time in the text mode.

4. The image reading apparatus according to claim 2, wherein the image processing modes include a binary mode and a multi-valued mode, and a wait time in the multi-valued mode is longer than a wait time in the binary mode.

5. The image reading apparatus according to claim 1, further comprising:

10 a timer for measuring an elapsed time since a previous OFF timing of said illumination light source, and a time since said illumination light source is turned on; and

15 an instruction unit for issuing a read instruction of an object,

wherein when said instruction unit issues the read instruction of the object, said controller sets the wait time in correspondence with the elapsed time measured by said timer and the currently set image processing mode, and turns on said illumination light source again, and controls said photoelectric converter to begin to read said reference member after a lapse of the wait time since said illumination light source is turned on.

20 25 6. The image reading apparatus according to claim 5, wherein when the time measured by said timer is not less than a predetermined time, said controller sets

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the wait time to be a predetermined time irrespective of the currently set image processing mode.

7. The image reading apparatus according to claim 6, wherein the image processing modes include a text mode and a photo mode, and when the time measured by said timer is shorter than the predetermined time, the wait time set in the photo mode by said controller is longer than the text mode.

8. The image reading apparatus according to claim 6, wherein the image processing modes include a binary mode and a multi-valued mode, and when the time measured by said timer is shorter than the predetermined time, the wait time set in the multi-valued mode by said controller is longer than the binary mode.

9. The image reading apparatus according to claim 5, wherein when the time measured by said timer is not less than the predetermined time, said controller sets the wait time to be longer than a wait time set when the measured time is less than the predetermined time.

10. The image reading apparatus according to claim 9, wherein when the time measured by said timer is not less than the predetermined time, said controller sets a wait time by adding an addition time to a wait time set in a corresponding image processing mode when the time measured by said timer is shorter than the predetermined time.

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11. The image reading apparatus according to claim 9, wherein the image processing modes include a text mode and a photo mode, and a wait time in the photo mode is longer than a wait time in the text mode.
- 5 12. The image reading apparatus according to claim 9, wherein the image processing modes include a binary mode and a multi-valued mode, and a wait time in the multi-valued mode is longer than a wait time in the binary mode.
- 10 13. The image reading apparatus according to claim 1, wherein an amount of light emitted by said illumination light source decreases from an amount of light immediately after said illumination light source begins to emit light along with a lapse of time, after said 15 illumination light source is turned on.
14. The image reading apparatus according to claim 1, wherein said illumination light source is one of incandescent lamps including a xenon lamp, fuse lamp, halogen lamp, and the like, fluorescent lamps such as 20 an electrodeless rare gas lamp, hot cathode fluorescent lamp, cold cathode fluorescent lamp, semi-hot lamp, and the like, an LED, a gas laser, a semiconductor laser (LD), and electroluminescence.
- 25 15. The image reading apparatus according to claim 1, wherein said reference member is detachable.
16. A control method for controlling an image reading apparatus which can operate in a plurality of image

processing modes, and includes a photoelectric converter for reading an object image and outputting an electrical signal, a reference member used to correct image read nonuniformity of the photoelectric converter, 5 and an illumination light source for illuminating an object and the reference member with light,

wherein a read start timing of the reference member by the photoelectric converter since the illumination light source is turned on is controlled in 10 correspondence with a currently set image processing mode of the plurality of image processing modes.

17. The control method according to claim 16, comprising:

15 a checking step of checking the currently set image processing mode;

a setting step of setting a wait time in correspondence with the currently set image processing mode;

20 a time measurement step of measuring time since the illumination light source is turned on; and

a control step of controlling the photoelectric converter to begin to read the reference member after a lapse of the wait time since the illumination light source is turned on.

25 18. The control method according to claim 17, wherein the image processing modes include a text mode and a

photo mode, and a wait time in the photo mode is longer than a wait time in the text mode.

19. The control method according to claim 17, wherein the image processing modes include a binary mode and a  
5 multi-valued mode, and a wait time in the multi-valued mode is longer than a wait time in the binary mode.

20. The control method according to claim 16,  
comprising:

an instruction step of issuing a read instruction  
10 of an object;

a first time measurement step of measuring an elapsed time since a previous OFF timing of the illumination light source;

15 a checking step of checking the currently set image processing mode;

a setting step of setting, when the read instruction of the object is issued in said instruction step, the wait time in correspondence with the elapsed time measured in said first time measurement step, and  
20 the currently set image processing mode;

a turn-on step of turning on the illumination light source;

a second time measurement step of measuring time since the illumination light source is turned on; and

25 a control step of controlling the photoelectric converter to begin to read the reference member after a

lapse of the wait time since the illumination light source is turned on again.

21. The control method according to claim 20, wherein when the time measured in said first time measuring

5 step is not less than a predetermined time, the wait time is set to be a predetermined time in said setting step irrespective of the currently set image processing mode.

22. The control method according to claim 21, wherein

10 the image processing modes include a text mode and a photo mode, and when the time measured in said first time measuring step is shorter than the predetermined time, the wait time set in the photo mode in said setting step is longer than the text mode.

15 23. The control method according to claim 21, wherein the image processing modes include a binary mode and a multi-valued mode, and when the time measured in said first time measuring step is shorter than the predetermined time, the wait time set in the

20 multi-valued mode in said setting step is longer than the binary mode.

24. The control method according to claim 20, wherein when the time measured in said first time measuring step is not less than the predetermined time, the wait

25 time is set in said setting step to be longer than a wait time set when the measured time is less than the predetermined time.

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25. The control method according to claim 24, wherein  
when the time measured in said first time measuring  
step is not less than the predetermined time, a wait  
time is set in said setting step by adding an addition  
5 time to a wait time set in a corresponding image  
processing mode when the time measured in said first  
time measuring step is shorter than the predetermined  
time.
26. The control method according to claim 24, wherein  
10 the image processing modes include a text mode and a  
photo mode, and a wait time in the photo mode is longer  
than a wait time in the text mode.
27. The control method according to claim 24, wherein  
the image processing modes include a binary mode and a  
15 multi-valued mode, and a wait time in the multi-valued  
mode is longer than a wait time in the binary mode.
28. The control method according to claim 16, wherein  
an amount of light emitted by the illumination light  
source decreases from an amount of light immediately  
20 after the illumination light source begins to emit  
light along with a lapse of time, after the  
illumination light source is turned on.
29. The control method according to claim 16, wherein  
the illumination light source is one of incandescent  
25 lamps including a xenon lamp, fuse lamp, halogen lamp,  
and the like, fluorescent lamps such as an  
electrodeless rare gas lamp, hot cathode fluorescent

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lamp, cold cathode fluorescent lamp, semi-hot lamp, and  
the like, an LED, a gas laser, a semiconductor laser  
(LD), and electroluminescence.

30. The control method according to claim 16, wherein  
5 the reference member is detachable.

31. A computer program product comprising a computer  
usable medium having computer readable program code  
means embodied in said medium for controlling an image  
reading apparatus which can operate in a plurality of  
10 image processing modes, and includes a photoelectric  
converter for reading an object image and outputting an  
electrical signal, a reference member used to correct  
image read nonuniformity of the photoelectric converter,  
and an illumination light source for illuminating an  
15 object and the reference member with light, said  
product including:

computer readable program code means for  
controlling a read start timing of the reference member  
by the photoelectric converter after the illumination  
20 light source is turned on in correspondence with a  
currently set image processing mode of the plurality of  
image processing modes.

32. The computer program product according to claim  
31, comprising:

25 first computer readable program code means for  
checking the currently set image processing mode;

second computer readable program code means for setting a wait time in correspondence with the currently set image processing mode;

third computer readable program code means for  
5 measuring time since the illumination light source is  
turned on; and

fourth computer readable program code means for controlling the photoelectric converter to begin to read the reference member after a lapse of the wait time since the illumination light source is turned on.

10 time since the illumination light source is turned on.

33. The computer program product according to claim  
31, comprising:

first computer readable program code means for issuing a read instruction of an object;

second computer readable program code means for measuring an elapsed time since a previous OFF timing of the illumination light source;

third computer readable program code means for  
checking the currently set image processing mode;

20 fourth computer readable program code means for,  
when the read instruction of the object is issued,  
setting the wait time in correspondence with the  
measured elapsed time, and the currently set image  
processing mode;

fifth computer readable program code means for turning on the illumination light source;

sixth computer readable program code means for measuring time since the illumination light source is turned on; and

- seventh computer readable program code means for
- 5 controlling the photoelectric converter to begin to read the reference member after a lapse of the wait time since the illumination light source is turned on again.

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